

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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REC'D 13 JUN 2005

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/EP2005/001208

International filing date (day/month/year)
07.02.2005

Priority date (day/month/year)
20.02.2004

International Patent Classification (IPC) or both national classification and IPC
G01J3/46, G01J3/50, A61C19/10

Applicant
TROPHY RADIOLOGIE S.A.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2005/001208

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2005/001208

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 11-20

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the whole application or for said claims Nos. 11-20

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2005/001208

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-10, 21-31

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-4, 6, 10, 22-24, 26-31
	No: Claims	1, 5, 7, 8, 9, 21, 25
Inventive step (IS)	Yes: Claims	
	No: Claims	1-10, 22-31
Industrial applicability (IA)	Yes: Claims	1-10, 22-31
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item IV

The separate inventions/groups of inventions are:

1. Claims 1-10, 21-31

Independent claim 1 refers to a dental shade measuring device and the corresponding method comprising

- illumination means for successively illuminating at least one part of a tooth with light of various spectral ranges
- a monochrome sensor sensitive to intensity of light coming from said tooth part
- means for converting the measurement signals into coordinates of a measurement point in a shade space in which reference points are defined, corresponding to the present shades of a dental shade guide
- automatic shade search means for searching a shade corresponding to the reference point closest to the measurement point.

The technical problem to be solved by this group can be construed as how to free the evaluation of dental shade from the subjectivity part related to the practitioner.

2. Claims 11-20

Claim 11 refers to a measuring instrument comprising a sensor and an illumination head provided with a plurality of light emitting sites linked to the light sources.

The technical problem to be solved by this group can be construed as how to obtain a compact measuring instrument which can be used for the teeth located in the back part of the mouth.

Groups 1 and 2 are not so linked as to form a single general inventive concept (Rule 13.1 PCT) because the only common technical features are the illumination means and the sensor, which are well known in the art. The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following document:

D1: US4654794

1. Lack of clarity

The application does not meet the requirements of Article 6 PCT, because claims 1, 11 and 21 are not clear.

1.1 The term "automatic shade search means" used in claim 1 is broader than justified by the description and the drawings because it could refer to visual or any other kinds of shade search means. The appropriate formulation would be "a calculator" as disclosed in page 4, lines 16 of the description. The same applies to claim 21.

1.2 The formulation of claim 11 is ambiguous because it could be interpreted as a dependent claim on claim 1. However, claim 11 is an independent claim because the measuring instrument 10 does not include all the features of the dental shade measuring device of claim 1 (see Rule 29(4) EPC. In particular, the measuring instrument 10 should comprise "a sensor 26" instead of "the sensor 26". Furthermore, the formulation "for a device according to claim 1" does not limit clearly the claimed object.

2. Lack of novelty

The present application does not meet the criteria of Article 33(1) PCT, because the dental shade measuring device of claim 1 and the corresponding method of claim 21 are not novel in the sense of Article 33(2) PCT for the following reasons:

2.1 The document D1 discloses (the references in parentheses applying to this document):

- a dental shade measuring device (abstract) comprising
 - illumination means (8) for successively illuminating at least one part of a tooth with light of various spectral ranges
 - at least one monochrome sensor (6) sensitive to intensity of light coming from said tooth part, in response to the illumination, to generate for each different color of illumination, at least one measurement signal
 - means for converting the measurement signals (11) corresponding to said tooth part, into coordinates of a measurement point, in a shade space in which "reference" points are also defined, corresponding to the present shades of a dental shade guide (col.1, lines 53-60)
 - automatic shade search means for automatically searching a shade corresponding to the reference point closest to the measurement point, in the shade space for said tooth part (col.1, lines 53-60)
3. Dependent claims 5, 7-9, 25 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty, the reasons being as follows:
- Claim 5:** See D1, fig.1
- Claim 7:** See D1, fig.1, measuring instrument (8, 9, 2, 3, 4, 6, 7)
- Claim 8:** See D1, fig.1, fiber optic link
- Claim 9:** See D1, fig.1, photodiode (6)
- Claim 25:** See D1, col.6, line 54 - col.7, line 12 and claim 8
4. Lack of inventive step
- Dependent claims 2-4, 6, 10, 22-24, 26-31 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:
- Claims 2, 3, 4, 6, 22:** The use of monochrome or cold or infrared sources or laser diodes is obvious for the person skilled in the art of spectroscopy.
- Claim 10:** The use of image sensors with a plurality of pixels is well known in colorimetry.
- Claim 26:** The establishment of an average shade which is weighted by the roughness parameter is a standard technique in the art of colorimetry.
- Claims 23, 24, 27, 28, 30, 31:** The establishment of the coordinates of the measuring

point according to the gap between the light received in the presence and in the absence of the stimulated illumination light is also a standard procedure in the art of colorimetry. The same applies to the methods of claims 28, 30, 31.

Claim 29: The application of a transparent substance in liquid or gel form to the tooth part is well known in the art of dental shade measurements.

5. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.